

Comparative analysis of total ocular aberrations and posterior corneal surface metrics following Ultra-Thin Manual Descemet's Stripping Endothelial Keratoplasty (UTMDSEK): A pilot study.

ESCRS Congress Sep 2014

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Declaration: No financial interests

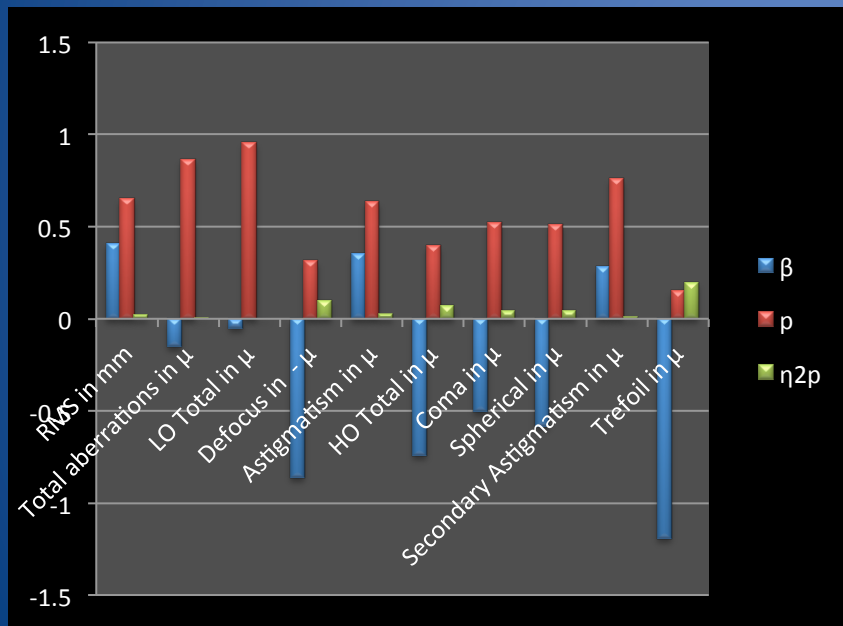
Descriptive statistics for aberrations and topography. n= 14

- True net power = addition of refractive values of anterior and posterior corneal surfaces.
- KPD= Keratometric power deviation map gives the difference at each point between the true net power map and the sagittal power map of the anterior corneal surface.

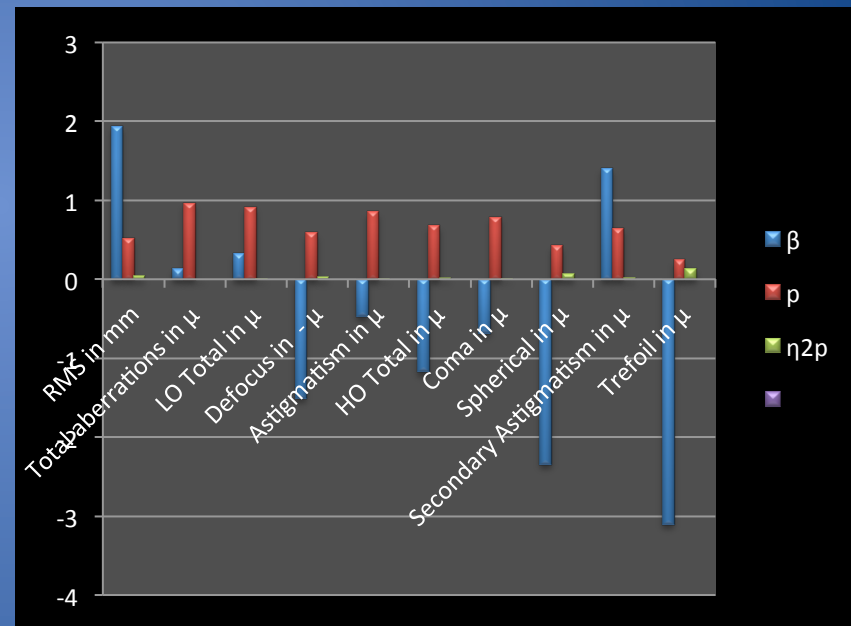
Measure	Mean	Std Dev	Min	Max
RMS (mm)	3.35	.34	2.63	3.80
Total aberrations (μ)	.70	.23	.33	1.11
LO Total (μ)	.62	.23	.28	1.03
Defocus (μ)	.26	.38	-.51	.80
Astigmatism (μ)	.42	.24	.04	.91
HO Total (μ)	.30	.11	.14	.53
Coma (μ)	.15	.10	.01	.31
Spherical (μ)	.04	.07	-.06	.21
Secondary Astigmatism (μ)	.09	.07	.02	.30
Trefoil (μ)	.14	.07	.05	.25
Sagital curvature	6.17	.55	5.00	6.96
KPD=	1.74	.53	.90	2.80
True net power	40.31	1.84	37.00	42.00

Beta, p and partial eta squared values for the multivariate multiple regression analysis

Predictor: True net power



Predictor: KPD



Results I

Mean preoperative monocular BCVA was 0.50 ± 0.18 logMAR.

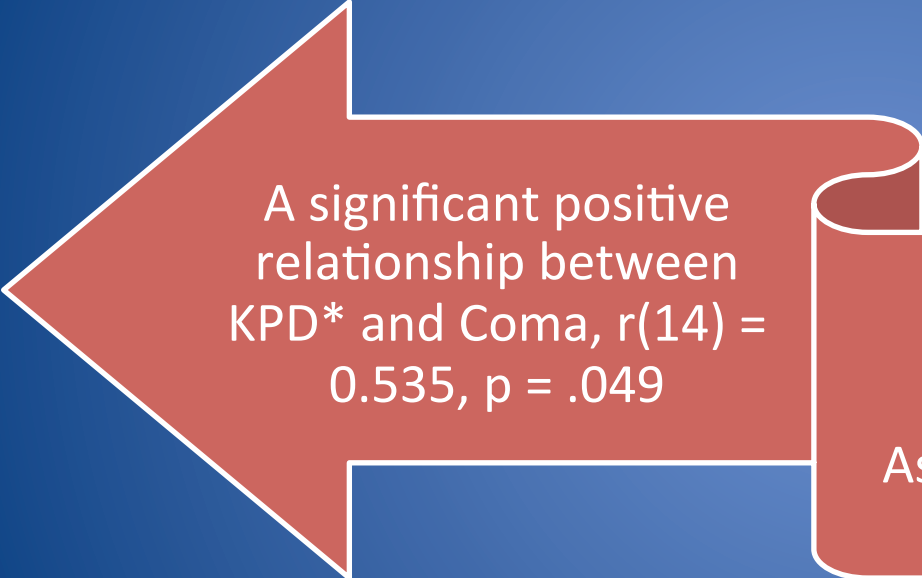
Graft thickness was $116 \mu\text{m} \pm 58.0$

Mean follow up: 27.08 months, range (8-46 months).

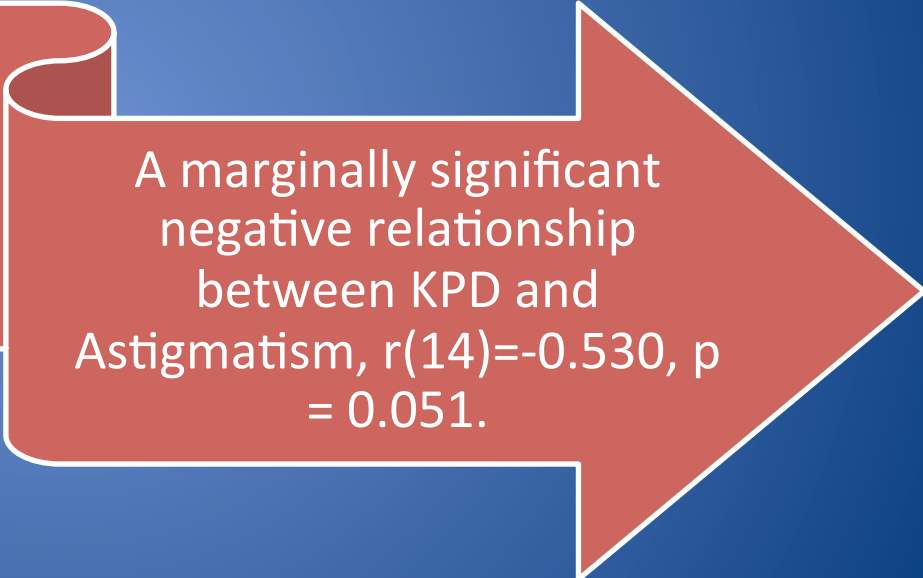
The mean preoperative MRSE was $+0.81 \text{ D} \pm 3.03$.
At last follow up, the mean postoperative MRSE was $-0.15 \text{ D} \pm 1.32$.

The mean postoperative monocular BCVA was 0.23 ± 0.15 logMAR

Results II



A significant positive relationship between KPD* and Coma, $r(14) = 0.535$, $p = .049$



A marginally significant negative relationship between KPD and Astigmatism, $r(14) = -0.530$, $p = 0.051$.

Conclusion

- In normal corneas it's widely known; posterior corneal surface aberrations neutralize most of anterior corneal surface aberrations, the posterior corneal surface influence is best represented in topographic terms by Keratometric Power Deviation (KPD).
- This critical interaction is compromised in DSEK patients, due to the lenticule and loss of parallelism between anterior and posterior corneal surfaces.
- This compromised interaction was seen in our cohort as every patient demonstrated topographically a trend of higher KPD values than normal >0.75 , which correlated significantly with higher coma aberrations.
- Posterior corneal surface optics are of paramount importance in endothelial keratoplasty outcomes.